FRD ACTIVITIES REPORT
May 2007

Research Programs

Urban Dispersion Program

The revised manuscript "Atmospheric flow decoupling and its effects on urban plume dispersion" has been completed, re-reviewed, and will be submitted to the journal Boundary Layer Meteorology in early June. The revised manuscript develops the case for nocturnal flow decoupling during Joint Urban 2003 and how that affected the character of plume dispersion.

The manuscript "Analysis of plume dispersion in a nocturnal urban boundary layer in complex terrain, Salt Lake City, URBAN 2000" has completed internal FRD review and the subsequent revisions are very nearly complete. It will be submitted for ARL review in early June. (Dennis Finn, 208-526-0566)

Perfluorocarbon Tracer Analysis Development

As part of our development of a perfluorocarbon (PFC) tracer capability, we are conducting tests on the aging characteristics of PFCs in our sample bags. Sampling cartridges, which consist of 12 sample bags, were filled with three concentrations of PFCs and the concentrations have been monitored by repeated analysis while they aged. Tests for low (250 pptv), middle (4,000 pptv), and high (100,000 pptv) concentrations are still in progress. Each set of cartridges have been analyzed over periods of 3-4 months. All indications suggested that the concentrations in the sample bags maintained their original concentrations until the latest round of analyses in late May. There was some evidence hinting that the concentrations had declined, especially for the most volatile of the PFC species (PDCB). Furthermore, low shoulders developed on the PDCB peaks that complicated peak integration. Subsequent monthly analyses will hopefully determine the significance and reliability of these anecdotal observations. Knowing sample aging characteristics is essential because samples collected as part of a field study must be analyzed before the concentration changes in order for the sample data to be valid. (Dennis Finn, 208-526-0566, and Roger Carter)

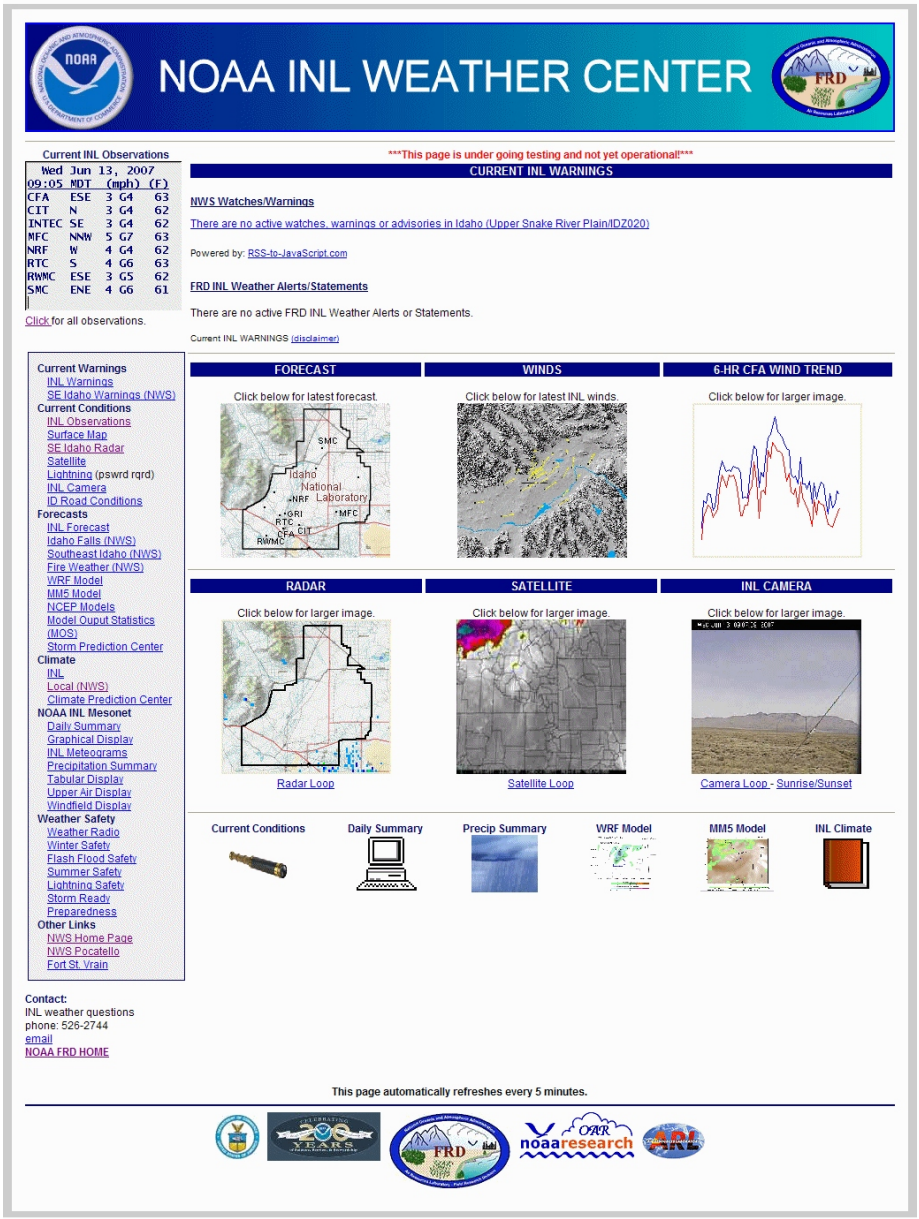
Cooperative Research with DOE NE-ID (Idaho National Laboratory)

DOE Meeting

Kirk Clawson, Richard Eckman, and Donna Harris met with DOE officials Betsy Holmes and Kathy Stallman to discuss the Memorandum of Understanding (MOU), the interagency agreement of work (IAG), and the statement of work. A final push was talked about to get the MOU agreed upon. DOE discussed including dispersion modeling of in town facilities in the

IAG. FRD promised to have a statement of work completed within the middle of June. The goal is to have the MOU and IAG approved by September 30th. (Kirk Clawson, 208-526-2742, and Richard Eckman)

NOAA INL Weather Center Web Page



Progress continues on the development and testing of the new NOAA INL Weather Center web page (see figure). This one stop weather web page has been designed to simultaneously provide "INL site specific" meteorological information to both emergency and daily operations managers. Processes and programs running on the new web page such as the severe weather hazards, current observations and summaries, and wind trends information have been updating accurately and regularly during the testing period. Several DOE officials along with top emergency and operations managers have seen the new web page and are excited for its release to the site. The new url is http://niwc.noaa.inel.gov/ and is expected to be officially released to the INL by the middle of June. (Brad Reese, 208-526-5707, Jason Rich, Neil Hukari, and Kirk Clawson)

Radar Wind Profiler Repair

Several days of data have been collected by the spare radar wind profiler. The profiler was set to collect hour averaged winds at two different height resolutions. We are comparing the profiles

generated to see if they are consistent with each other in the interval where they overlap. Some of the profiles compare very well while others show significant differences. It is not clear if these differences are due to a system problem or some other source. We will be examining the doppler velocities along each beam to see if they indicate a problem with the profiler itself. (Roger Carter, 208-526-2745, Tom Strong, and Shane Beard)

Emergency Operations Center (EOC)

On May 24, Team C attended an EOC requalification drill. The drill scenario was centered on a drum that contained radioactive material that was accidentally ruptured at the MFC facility. Team C operated the MDIFF transport and dispersion model and forecasted the weather conditions during the drill. (Roger Carter, 208-526-2745, and Neil Hukari)

INL Wildfire Modeling

With the Idaho wildfire season fast approaching, a simple fire-hazard forecast tool has been developed using the output from the WRF model. It is based on thresholds in weather conditions that local fire managers consider to represent a significant fire danger. Forecast wind speed, temperature, and relative humidity from the WRF runs at FRD are used to compute a simple fire hazard index. Starting in June, this index will be displayed on the FRD web site along with the other WRF graphics. (Richard Eckman, 208-526-2740)

Collaborative Research

A couple of manuscripts are being prepared as part of an effort to better understand the uncertainty associated with turbulence measurements. One manuscript describes the use of Bayesian autoregressive models to estimate uncertainty in turbulence statistics. A second manuscript is a comment on a recent paper in *Boundary Layer Meteorology* that questions the use of time averaging for determining certain turbulence parameters, including the integral time scale. The topics addressed in both manuscripts are of direct relevance to the INL Mesonet data collected by FRD. (Richard Eckman, 208-526-2740)

Other Activities

Outreach

Kirk Clawson gave an invited seminar to the Bonneville County Chapter of the Sons of the Utah Pioneers on May 17th. SUP members are focused on the history of the area. The presentation was titled “NOAA’s Field Research Division – Who Are We? What Do We Do?” and included a history of FRD and its current research projects.

Papers

Eckman, R.M., R.J. Dobosy, D.L. Auble, **T.W. Strong, T.L. Crawford,** 2007: A pressure-sphere anemometer for measuring turbulence and fluxes in hurricanes, *Journal of Atmospheric and Oceanic Technology*. (In press; schedule for publication in June)

Carter, R.G., N.F. Hukari, and J.D. Rich, 2007: Identifying Natural Clusters in Eastern Idaho Wind Fields: A Practical Application of Cluster Analysis to Wind Forecasting. *Weather and Forecasting*. (In review)

Allwine, J., J. Heiser, J. Flaherty, T. Watson, **K. Clawson**, P. Kalb, K. Clark, 2007: Urban Dispersion Program and Opportunities for Emergency Preparedness, *2nd Annual NYC Interagency Workshop "Using Environmental Data during Emergencies: From Field Data Collection to Risk Communication"*, New York, NY. (In review)

Finn, D., K.L. Clawson, R.G. Carter, J.D. Rich, C. Biltoft, K.J. Allwine, J.E. Flaherty, and M.J. Leach, 2007: Analysis of Plume Dispersion, Decay, and Peak-to-Mean Excursions for Continuous Tracer Gas Releases in an Urban Core, Oklahoma City, JU2003. (Completed FRD review)

Safety

All employees completed the on-line CPR training.

The NOAA Safety and Environmental Compliance Office has mandated all employees and contractors to complete the updated mandatory on-line safety awareness course by June 30, 2007. As of May 31, 2007 eight employees had completed this course.

Donna Harris, FRD safety officer, gave handouts on awareness and prevention of skin cancer, and then held a group discussion at monthly staff meeting.

An inventory of all Electron Capture Detectors (ECD) and wipe tests required by the Nuclear Regulatory Agency (NRC) were completed by Roger Carter. Results were sent to our Radiation Safety Officer, Rhonda Carpenter.

Travel

Kirk Clawson traveled to San Antonio, TX, on May 6th to attend DOE Meteorological Coordinating Council (DMCC), Emergency Management Issues Special Interest Group (EMI SIG), and Subcommittee on Consequence Assessment and Protective Actions (SCAPA) meetings. He gave two presentations at the DMCC meeting titled: "NOAA/INL Meteorological Research Partnership Status," and "Atmospheric Flow Decoupling in an Urban Environment and its Effects on Plume Dispersion."

Training

Kirk Clawson, Jason Rich, Roger Carter, Dennis Finn, Neil Hukari, Rick Eckman, and Shane Beard attended the Bonneville County Weather Spotter Training provided by the National Weather Service on May 29. All of the staff members that attended the training are now registered as SKYWARN spotters. This is a continuation of the increasing collaboration between FRD and the NWS forecast office in Pocatello. To avoid redundant reporting, severe weather spotting during normal working hours will be coordinated through the INL forecaster at FRD. During off-duty hours, any the of FRD spotters are free to report from their homes or other locations. (Kirk Clawson, 208-526-2742, and Richard Eckman)

Personnel

Kirk Clawson, Brad Reese, Jason Rich, and Donna Harris have approved telework procedures on file.

Diversity

At the monthly staff meeting, FRD employees under the guidance of Donna Harris reviewed the history of Cinco de Mayo and the Mexican Hat Dance.

Miscellaneous

May 30th was designated as "Office Cleanup" Day. All employees put on work gloves to clean up around the FRD building and compound area. The effort included sending to surplus the last of the big iron (the buses). The building and grounds are now ready to accommodate a VIP from NOAA, OAR, or ARL.